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Budget Reform

Should There Be a Capital Budget for the Public Sector?

D.A.L. Auld

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Contents

Foreword v

Introduction 1

Public-Sector Investment: An Overview 2

Public-Sector Borrowing and Capital Spending: A Short History .....
The Classical View 5
The Keynesian View 5
The Neoclassical View 7
..... 8

Is There a Case for a Public Capital Expenditure Budget? 10
The Theory of Public Capital Budgeting 10
Advantages of a Capital Budget 10
Disadvantages of a Capital Budget 14
..... 15

Public Capital Formation: What Should Be Included 16

Measuring Public Capital Expenditure in Canada 21
The Federal Government 21
The Ontario Government 25
The Total Public Sector 27

Summary and Implications 31

Figures

1 Federal Capital Expenditures, 1972–82 24
2 Public-Sector Capital Expenditures, 1972–82 29

Tables

1 Public-Sector Current and Capital Budget Accounts 12
2 Federal Capital Expenditures: Nonmilitary and Military, 1972–82 22
3 Federal "Indirect" Gross Fixed Capital Expenditures: Estimated, 1972–82 23
4 Federal Capital Expenditures, 1972–82 25
5 Ontario Capital Expenditures, 1972–81 27
6 Public-Sector Investment Expenditures, 1972–82 28
7 Public-Sector Net Capital Expenditures, 1972–82 30
8 Public-Sector Net Capital Stock, 1972–82 32

Foreword

In the mid-1980s evaluation of federal budget policy focuses for understandable reasons on the significance of deficits. Hard choices must be made to cut spending and raise taxes if rapidly growing public-sector borrowing requirements are to be reduced to sustainable levels.

In most Canadian analysis of expenditure policy, both current and capital spending tend to be lumped together. Yet investment in public capital assets has benefits that are spread over future generations. One option for distinguishing capital spending from existing budgets is to create a capital budget in the public sector.

The C.D. Howe Institute asked Professor D.A.L. Auld, Chairman of the Economics Department at the University of Guelph, to examine the case for capital budgeting in Canada. His objectives are to examine the conceptual issues and to break important ground in measuring capital expenditures in the public sector during the past decade. He develops a capital budget account that could accompany annual public budgets.

This *Policy Commentary* is published in the hope that it will provoke a serious discussion about the value of capital budgets for evaluating federal and provincial budget policy. The conclusions are those of the author and do not necessarily reflect those of the Institute.

Dr. Wendy Dobson
Executive Director

This is perhaps the sole benefit of a national debt; and even this is attended with some danger, inasmuch as it enables a government to squander the national savings. For, unless the principal be spent upon objects of permanent public benefit, as on roads, canals and the like, it were better for the public that the capital should remain inactive, or concealed; since if the public lost the use of it, at least it would not have to pay this interest.

J.D. Say, *A Treatise on Political Economy*

Introduction

When the budget practices of governments come under fire, as they are these days, the central topic of discussion is deficits and how they can be reduced. Other important issues are obscured. One main issue receiving short shrift is that government expenditures with widely differing implications — such as transfer payments to families, military spending, and investment spending — all come under the same umbrella. Because investments add to the economy's wealth-generating capacity, there is a case to be made for spreading their cost through time and accounting for them separately.

The nature of public assets, their creation, and their links with economic growth in the private sector receive insufficient attention in debates about public-sector budgets. Nor is it well recognized that, once in place, assets need to be maintained and eventually replaced. The difference between public spending on publicly owned assets and that on private assets seems little understood.

What is needed is a public-sector capital budget that could separate from existing budgets those expenditures that create public capital assets and whose benefits are spread over future generations. The capital budget would create a framework that permits the kind of logical and all-encompassing view of public spending that is important in establishing public spending priorities, especially when restraint is an overriding concern of budget policy. Current accounting practices do not allow for such a review because they do not clearly differentiate between current and capital expenditures.

The purpose of this *Policy Commentary* is to provoke a serious discussion of the value of capital budgets for the federal and provincial governments in Canada. The analysis that follows is not an apology for cyclical or structural deficits. Its objective is to provide a more logical and rational base for both short- and long-term financing decisions of governments. To do so, more attention must be given to the structure of public-sector budgets and to the impact that structure has on financing requirements. The first section examines the role of the public sector as an investor in physical and human capital. The second section explores the background to the concept of a capital budget. The third section provides the basic theoretical foundation for a capital budget in the public sector and, at the same time, explores some of the major problems in the practical implementation of such a budget. The fourth section provides and makes a case for a broader, more comprehensive method of quantifying such capital formation. The fifth section attempts to measure total capital expenditures in the public sector

during the past decade. The concluding section summarizes the advantages and disadvantages of a capital budget, evaluates the implications that such a reform might have on budget policy, and suggests the establishment of a simple capital budget account that would accompany the current annual budgets of governments.

Public-Sector Investment: An Overview

In most discussions of public-sector budgets and their financing, there appears to be little recognition that governments allocate a significant share of their revenues to long-term investments. The federal government, in particular, is responsible for this misconception since its current budgetary practice is to treat the construction of airport facilities or support for satellite construction in the same manner as the meal subsidy in the parliamentary dining room. There is no formal provision for depreciation reserves as a means of replacing worn-out or obsolete capital and little idea of the net worth that lies behind government debt. Discussions about deficit financing and borrowing, therefore, cannot be based on complete information, nor is enlightened debate possible in Canada over the current level and composition of public expenditure.

These discussions of public-sector deficits fail to note the role governments play in the development of the nation's capital stock and the assets needed to ensure technological progress and economic growth. In addition to expenditures on transportation networks — roads, rail facilities, harbors, airports — communications, and water and sewage facilities, governments must ensure that sufficient physical assets are provided to meet demands for health care, education, and social services. Governments are also required to manage the country's natural resources and the environment, concerns that often require the purchase of physical assets to ensure their preservation and development.

By far the most widespread misperception about public-sector budgets is the belief that all public expenditure is "unproductive" — that it does not enhance the productivity and growth of the economy. Such a belief fails to recognize that, in addition to large outlays for what might be termed "government consumption expenditure", a significant portion of public expenditure is allocated to fixed capital formation, both directly through the creation of a public infrastructure, and indirectly through encouraging private investment with a variety of capital subsidies and joint public- and private-sector arrangements. In short, governments undertake large investment expenditures that are

often, in the case of expenditures on fixed assets, very similar to those undertaken in the private sector. Such expenditures do not, however, lead *directly* to the production of a final, marketable output. Because of this characteristic, it has not been possible to devise any agreed statistical measure that would permit an analysis of the change in output in response to a change in public capital inputs. Public-sector "output", by its very nature, must be measured in terms of inputs, an approach that would be unthinkable in the private sector.[1] The most common aggregative measure of productivity growth is the percentage change in the ratio of real output to employment. Without a measure of public-sector output, however, the published accounts do not lend themselves to a reflection of any productivity growth in the public sector.[2] Since the direct, measurable link between inputs and outputs is extremely difficult, if not impossible, to measure in the case of public goods, such expenditure has had to bear the label "unproductive".

If one stops to think about the direct contribution of the public sector's investments, however, such a label is surely inappropriate. A common argument in discussions of productivity and output is that the output of goods and services is directly related to the amount of labor and private-sector capital used as inputs. This is not a complete specification of the relationship between outputs and inputs, however, since it excludes such public capital assets as communications systems, waste disposal facilities, transportation networks, and that capital associated with property protection. All of these public assets are necessary to ensure private-sector output of goods and services. The quality, as well as the quantity, of labor is also important and, to a significant extent, changes in quality are a direct consequence of public-sector investments in education and training. While changes in public capital are reflected in the production function, they are not attributed to the public sector.

Consider a new satellite communications system that improves planning in a multiplant, international firm in a way that enhances output, even though the capital and labor in the firm remains unchanged. The increase in output per unit of capital or labor will probably be attributed to entrepreneurial talent or to a new organization system. Without

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[1]As Dr. Barry Bosworth said more than a decade ago, "Productivity growth in government is zero by definition: Output is measured by labor input." See B. Bosworth, "Comments and Discussion," *Brookings Papers on Economic Activity* 3 (1972): 538.

[2]This particular problem has been discussed elsewhere. See D.A.L. Auld, *Issues in Government Expenditure Growth* (Montreal: C.D. Howe Research Institute, Canadian Economic Policy Committee, 1976).

the public investment in the satellite, however, no productivity improvement would have occurred. The firm may well pay for some share of the cost of the communications system through user charges or corporate taxes but such a payment is not likely to be viewed as an investment expenditure.

Other public investment expenditures on fixed assets may not lead to an increase in physical output but instead may reduce per unit costs of operating the firm. An improvement in transportation facilities is one example. The public sector also contributes to productivity growth in the private sector by way of its expenditure to enhance the quality of human capital. Although expenditure on education and training is not usually viewed by the private sector as an investment, and while there may be a dispute about the *extent* to which education expenditure contributes to productivity improvements in the labor force, there should be no doubt that such improvements do occur. Manpower retraining schemes and government-funded apprenticeships clearly enhance workers' skills. Furthermore, manpower retraining, in the absence of firms assuming the task, is a legitimate and important role for government.[3] Once again, corporations and other businesses pay for a share of this by way of taxation but such obligations are not usually viewed as "purchases" to enhance productivity.

In summary, then, the private sector could not function efficiently without the provision of public goods and services requiring public capital expenditures. If such activities were provided by the private sector, they would be included in a capital budget. While private provision of the desired level of job skills would not necessarily be treated as a capital expenditure, it is a form of investment, and given that the benefits from both types of expenditures will extend into the future, it may make good business sense to amortize such costs over a period of time greater than one year. The same accounting procedure should apply in the public sector. While there is a separation of expenditures on certain physical assets from total public expenditure in the national accounts, there is no separate public-sector capital account that provides a thorough analysis of public-sector capital expenditures.

The current debate over public-sector budget deficits and the appropriate level of public expenditure often lacks a historical perspective and tends to reflect strongly entrenched political views. An impor-

[3]While the private sector could undertake to provide the skill training, the mobility of labor makes it difficult for any one firm to reap the full benefits of its investment in skills. In the absence of binding contracts between employee and employer and among all firms, a less-than-optimal supply of skill training will be supplied.

tant part of the debate has become mired in the superfluity of statistics that relate to just how the budget balance is measured.[4] The impression that sometimes remains — that deficits reflect wasteful, unproductive public expenditure — ignores the fact that public infrastructure increases private-sector productivity. This is not to imply that all public spending is productive, but in order to shed light on these questions, budgetary accounting reform rather than national adjustments to budget items is needed. A formal capital expenditure is one reform that deserves serious attention.

Public-Sector Borrowing and Capital Spending: A Short History

While the idea of a public-sector capital budget and associated borrowing is obviously not new, few today would realize that the issue is as old as classical economics.[5] A historical perspective on what might at first be viewed as a "new" idea can help to shape that idea and relate it to the future. Historical reflection may also temper strong opinions in a debate by outlining the evolution of views over time. This history will summarize classical, Keynesian, and neoclassical views of the subject.

The Classical View

According to Adam Smith, who personified the views of many political economists in the latter part of the eighteenth century on the question of unbalanced public-sector budgets, for government to borrow money to finance public spending was to deprive society of funds that could be productively invested.[6] While his contemporaries argued that debt held in the country involved merely a transfer of funds from taxpayers to bondholders, Smith replied that public managers were not efficient with capital. J.B. Say agreed that, for the most part, public borrowing was unproductive and that it burdened society with interest payments. He did concede, however, that a limited amount of debt crea-

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[4]For a discussion of the official measurements, see R.M. Bird, *Financing Canadian Government: A Quantitative Overview*, Financing Canadian Federation no. 1 (Toronto: Canadian Tax Foundation, 1979). Adjustments to the budget balance that take account of persistent inflation and unemployment are described in D.A.L. Auld, "The Ontario Budget Deficit: A Cause for Concern?" in D.W. Conklin and T.J. Courchene, eds., *Deficits: How Big and How Bad?*, Ontario Economic Council Special Research Report (Toronto: Ontario Economic Council, 1983), pp. 78–107.

[5]It has been reported that the concept of a capital budget originated in the 1960s. See "Toward a Businesslike Budget," *Business Week*, 15 November 1982, p. 63.

[6]A. Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, vol. 2, E. Cannan, ed. (London: Methuen, 1930), pp. 409–411.

tion was acceptable provided it was "spent upon objects of permanent public benefits, as on roads, canals or the like."[7]

For David Ricardo, writing in the early part of the nineteenth century and also concerned with the public debt and unbalanced budgets, the major burden was not the interest on the debt — which was merely a matter of income redistribution — but the principal of the debt:

> When, for the expenses of a year's war, twenty millions are raised by means of a loan, it is the twenty millions which are withdrawn from the productive capital of the nation.... The real expense is the twenty millions and not the interest which must be paid for it.[8]

John Stuart Mill may have been the first economist to clearly recognize the existence of "financial crowding out" — the effect of borrowing on interest rates in financial markets. He argued that there were legitimate reasons for borrowing from the private sector: when there was an excess of capital in the rest of the world or when private savings would not have been transformed into productive investment. Mill argued that the interest required to solicit funds from the private sector was a test of the existence of excess funds. If the government solicitation raised interest rates, then it could be concluded that the capital could have been used productively in the private sector and under the circumstances such "loans are chargeable with all the evils that have been described."[9]

The latter half of the nineteenth century saw the emergence of a school of German economists who supported public-sector borrowing. Certain public expenditures were productive, this school argued, in the sense that they contributed to economic growth. There was also a case to be made for debt financing when public works such as national parks benefited future generations. While these views had little impact on writers in other countries at the time, they appear to have been used by early Keynesians to support their criticism of the balanced budget positions of most classical writers.

C.F. Bastable, writing at the end of the nineteenth century, was one exception. He maintained that there were two forms of public capital

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[7]J.B. Say, *A Treatise on Political Economy*, trans. C.R. Princip (Philadelphia: Lippincott, Grambo, 1853), p. 481.

[8]P. Sraffa and M.H. Dobb, eds., *The Works and Correspondence of David Ricardo*, vol. 1, *On the Principles of Political Economy and Taxation* (Cambridge: Cambridge University Press, 1951), p. 244.

[9]J.S. Mill, *Principles of Political Economy*, W.J. Ashley, ed. (London: Longmans, Green, 1929), p. 874.

spending, one involving expenditure on noneconomic projects such as school buildings, and the other for productive assets such as railways and telegraph systems. Although the latter ought to be financed by borrowing, school buildings, while perhaps indirectly productive, were of such a nature that it would be impossible to measure the return from investing in such projects. To justify borrowing for public expenditure, either the project so funded must generate revenue, or the large and nonrecurring nature of the expenditure must be such that complete tax financing would be too disruptive.[10]

By the time of the Keynesian attack on classical fiscal orthodoxy, specific principles of debt financing had been incorporated into the public accounts of a limited number of European countries, notably in Scandinavia, where the notion of a capital budget was well established. In the United States the idea of an investment budget and capital accounting was publicly raised in the late 1930s and early 1940s, but little change in budgetary procedures followed.[11]

The Keynesian View

It was Keynes who, in 1936 and earlier, spearheaded the attack on the fiscal orthodoxy of balanced budgets by arguing that, in a period of unemployment and excess capacity, deficit financing was efficient and noninflationary. In some ways Keynes' justification for deficit financing in periods of unemployment is only an elegant refinement of the position taken in 1848 by Mill when he argued in favor of borrowing,

> first, when what is borrowed is foreign capital, the overflowings of the general accumulation of the world; or, secondly, when it is capital which either would not have been saved at all unless this mode of investment had been open to it, or after being saved, would have been wasted in unproductive enterprises, or sent to seek employment in foreign countries.[12]

The idea that the economy could become moribund at an equilibrium level of GNP below full employment and thus require "pump-priming" was not immediately accepted by policymakers. It was, however, accepted in Canada by 1945:

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[10]C.F. Bastable, *Public Finance* (London: Macmillan, 1929), pp. 670–679.

[11]S. Thompson and J. Maxwell, *Yearbook of the Graduate School of Public Administration* (Cambridge, Mass.: Harvard University, 1941). See also R.A. Musgrave, "The Nature of Budgetary Balance and the Case for the Capital Budget," *American Economic Review* 29 (June 1939): 260–271.

[12]Mill, p. 874.

> The Government will be prepared, in periods when unemployment threatens, to incur the deficits and increases in the national debt resulting from its employment and income policy. . . . In periods of buoyant employment and income, budget plans will call for surpluses. The Government's policy will be to keep the national debt within manageable proportions, and maintain a proper balance in its budget over a period longer than a single year.[13]

It is clear that the federal government intended to use the instruments of budgetary policy to deliberately "unbalance" the budget for the purposes of controlling employment, output, and prices. While deficit financing was not related exclusively to the acquisition of capital assets, it was fairly clear that economic stimulation would emanate from the expenditure side of the budget, particularly by way of new public works spending. The importance of this emphasis on using public capital expenditure as the cyclical balancing weight should not be overlooked.

We have discussed public investment in a long-term context because such spending provides the infrastructure for private-sector productivity growth and wealth creation. The notion that such expenditures can be turned off and on based on short-term cyclical fluctuation may distort the optimal path, over time, of these investments. In addition, such investments may take on the character of a subsidy to unemployment. In a recession, it is politically more profitable in the short term to select projects for funding based on regional economic factors and labor-capital ratios than on long-term societal needs.

When the United States was actively pursuing Keynesian fiscal policies, there was renewed interest in the idea of capital budgeting in the public sector.[14] The impetus this debate gave to actual budgetary reform, including the establishment of a budget system to account separately for fixed capital expenditures, was lost with the emergence of the Vietnam War and the concentration on war financing.

The Neoclassical View

"Deficit financing" is the phrase that has been used to describe central government policies to combat unemployment by putting more purchasing power into the economy than is being withdrawn in the form of taxes. The term does, however, lead to confusion. A government may

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[13]Canada, Minister of Reconstruction, *Employment and Income, with Special Reference to the Initial Period of Reconstruction* (Ottawa: King's Printer, April 1945), p. 21.

[14]Much of the debate is reflected in a series of papers on budgetary reform by S. Harris et al., in *Review of Economics and Statistics* 45 (May 1963): 113–147.

experience a shortfall of tax and fee revenue to cover its expenditures and borrow from the private sector. If the funds on loan from the private sector represent postponed private spending — because of attractive terms offered by the borrower — the budget has no special net employment-creating effect. Indeed, such a policy may be less income-creating than if the government had raised taxes to make up the shortfall.[15] Alternatively, if the present generation views deficits as implying future taxes, it will set aside income today to pay for future liabilities. According to this view, debt financing, therefore, is the same as tax financing.[16]

These points are precisely those that form the cornerstones of the neoclassical view of the budget balance and that have led to the development of strong support, particularly in the United States, for annually balanced budgets.[17] It is contended that when a government borrows from the private sector, it preempts private investment and, at the same time, drives up interest rates in general. Since this action has no net income-creating impact on the economy, it is counterproductive, wasteful, and even deflationary because of the resulting higher interest rates. This argument has been made in the context of current budgetary practices that, as we have seen, make no formal distinction between current and capital expenditures. The case for — or against — annually balanced budgets, or balanced budgets over the cycle, would be much more meaningful if current and capital expenditures were clearly separated by means of a public-sector capital budget.

The idea of treating public capital spending separately in a government budget and financing such expenditures by borrowing is not new. To treat the construction of a bridge and the payment of wages to civil servants in the same accounting framework reflects less-than-adequate accounting practice. To assume that all public spending must be tax-financed ignores the flow of the benefits that many public assets provide over time. The purpose of the next two sections is to determine whether or not a conceptual and analytical framework can be developed to recognize these facts.

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[15]See, for example, E. Infante and J. Stein, "Does Fiscal Policy Matter?" *Journal of Monetary Economics* 2 (November 1974): 473–500.

[16]See R.J. Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy* 82 (November-December 1974): 1095–1117.

[17]The call for annually balanced budgets is forcefully argued in J.M. Buchanan and R.E. Wagner, *Democracy in Deficit: The Political Legacy of Lord Keynes* (New York: Academic Press, 1977).

Is There a Case for a Public Capital Expenditure Budget?

Capital investments in the private sector are undertaken to promote future revenue for a business. Such expenditures are not charged to the firm's current income because that would clearly distort the firm's financial picture over time. Instead, money is often borrowed in the current period, with the cost of the investment spread out over time in the form of depreciation over the "life" of the asset.

The benefits of public-sector capital investment are deemed to apply broadly across society in forms other than more public-sector revenue. While this *may* occur because of increased real income due to higher productivity, governments also undertake investments in what are referred to as "nonphysical" assets, such as a better-educated and healthier population. The benefits are even more indirect and more difficult to measure in a time framework. To complicate matters further, Canada's complex system of intergovernmental transfers makes it difficult to separate such "expenditures" into investments — as opposed to current expenditures — on goods, services, and transfer payments.[18] Even transfer payments may influence capital expenditures if they represent a subsidy to private business. Tax expenditures, at least those associated with the corporate income tax, are designed to stimulate private fixed capital formation. By granting a tax expenditure, the government sustains a "deficit" equal to the foregone current tax revenue; in exchange, private investment is expected to increase.[19] The government, therefore, is borrowing money for private investment and assuming the interest cost of the loan as well as the principal.

While the validity of these concepts may be acceptable, the problem of measurement is very difficult. Notwithstanding these barriers, it would appear fiscally imprudent and financially irresponsible to view all government spending as current, to be financed out of current tax revenues or other charges. Instead, the notion of a capital budget and its relationship to public borrowing deserves serious study.

The Theory of Public Capital Budgeting

If outlays are made for items that will benefit both the present and future generations, such outlays ought to be financed entirely from cur-

[18]They will, eventually, show up as capital or current expenditures but the puzzle is to appropriate the right amount of capital expenditure to the right level of government.

[19]For 1979, government statistics show that approximately $1.7 billion in tax expenditures was granted for programs that encouraged a variety of investment expenditures. See Department of Finance, *Government of Canada Tax Expenditure Account: A Conceptual Analysis and Account of Tax Preferences in the Federal Income and Commodity Tax Systems* (Ottawa, December 1979), pp. 33-47.

rent tax revenues. Fairness or equity among generations requires that the cost be shared over time, commensurate with the stream of benefits. If the present generation had to finance long-term public-sector investments entirely, such capital expenditures could be expected to be supplied only to the extent that the present generation obtains satisfaction from providing public capital for future generations. It seems highly unlikely that under those circumstances the supply of public capital would be sufficient to ensure maximum long-term economic growth. It is important to stress that, in the strictest sense, such a principle would have to be applied to all expenditures that are not made in a single year. All investment in human as well as in physical capital, therefore, would be included.

Applying such a principle may not be as difficult as it first appears as long as "nonphysical" investments raise society's future income — by way of enhanced labor productivity, for example. Such a contribution may be difficult to measure with any degree of precision but that should not in itself exclude such expenditures from a capital expenditure budget.

A more difficult question has to do with public-sector investments that do not lead, even conceptually, to a positive rate of return, either directly by enhancing taxable capacity, or by enhancing an economy's productive capacity in other ways. Investments that have a negative or zero rate of return, such as crown corporations or uncompetitive industries, would fall into this category. Consumption-oriented capital works such as wilderness parks and cultural or sports complexes, where the "service" is provided at a price less than that required to cover costs, may or may not fall into this category depending on the political valuation of their contribution to society's productive capacity.

In these and other public expenditures, there may exist an important element either of income redistribution or of a willingness to pay now for benefits that will not occur until well in the future. These unique characteristics make it difficult to compare public investments using the same specific criteria. That does not mean, however, that they ought to be excluded from a capital budget. The major question is whether or not the same borrowing and pay-back rules should be followed in all cases of public investment. Where the "investment" is made to sustain a work force in a particular region and industry in the short term, the expenditure is equivalent, at least in part, to a transfer payment and should be treated as such. In the case of a wilderness park, a case could be made for shifting a considerable portion of the burden to the future. Since there is clearly no precedent for such an arrangement, the

development of a capital expenditure budget would have to take into consideration that portion of such an expenditure that represents benefits accruing to future generations.

In the private sector, it would be normal to assume that any debt incurred would be offset by the acquisition of physical assets. This is not entirely applicable to the government, since public-sector solvency does not depend upon the value of assets held by the government but, rather, on the government's taxable capacity. Thus, while the idea of calculating changes in public net worth may be attractive to some, it has little meaning in determining the financial strength of the government.

To ensure appropriate financial accountability, the current — as contrasted to the capital — budget should include depreciation as well as interest costs associated with the debt.[20] Abstracting from active or passive fiscal policy decisions of a countercyclical nature, the appropriate current and capital budgets in simple form are shown in Table 1.

TABLE 1

Public-Sector Current and Capital Budget Accounts

Current budget	
Expenditures	**Revenues**
Goods and services (exhaustible)	Taxation revenues
Transfers to persons and businesses (excluding capital assistance)	Fees, charges, etc.
Interest on public debt	Transfers from private sector
Depreciation on existing assets	

Capital budget	
Expenditures	**Revenues**
Investment in capital assets	Proceeds of loan finance
Interest payments	Transfers from current budget (depreciation and interest)

Would such a scheme contribute to the analysis of capital spending and public-sector budgets in general? The answer depends, in part, on the economic environment. In a full-employment economy, both tax finance and borrowing for capital spending would reduce private spending in the current period. In subsequent periods, with loan

[20] It is interesting to note that in Australia, where there is a capital account for the federal government, depreciation is not strictly accounted for in the current budget. In the capital account, "sources of funds" includes an amount for depreciation and a much larger "surplus on current transactions", the latter clearly showing up in the current budget as an expenditure. See Australia, Bureau of Statistics, *Australian National Accounts* (Canberra, annual).

finance, interest would be returned to the lenders — paid for either through current taxes or by "rolling over" the debt — and the principal would be paid back after the term of the loan or bond. The pay-back would be made directly out of funds set aside as depreciation on the capital or would be reinvested, thereby expanding net worth. Without such a formal accounting, the country runs the risk of unwittingly running down its public capital stock by postponing maintenance in favor of current spending and transfers.

If, however, there are significant unemployed resources in the economy, then the government would not need to compete for scarce financial capital that would otherwise be channeled into private-sector projects.[21] The interest on any loan would thus be considerably lower than in the full-employment case. Consequently, while intergenerational equity may be served in principle, there is a disproportionate charge to future recipients of the benefits of such projects if they are undertaken at a time of full employment. This problem is exacerbated if public expenditure on capital projects is the dominant countercyclical tool. As previously noted, this should not be the case; public capital formation is a necessary long-term fiscal instrument that should not simply be subject to the vagaries of politicians in times of recession or inflation. The Special Recovery Capital Projects program announced in the April 1983 federal budget is a case in point. A large part of the program is clearly aimed at job creation in the short term, and while some of the investment spending is clearly overdue, the ad hoc approach within the current framework of the budget precludes any serious analysis of the contribution this spending makes to long-term optimal public capital formation.

There is a further problem of equity if the projects or programs funded by borrowing bestow a stream of future benefits only on specific sectors of the economy. If public-sector transportation facilities, for example, are developed that will be used only by one sector, such as the steel industry to increase exports, the benefits from such investment are likely to accrue to shareholders of steel companies and to present and future employees of the steel industry. True, there will be spillover effects of a general nature to other parts of the economy, but the benefits clearly will not be spread evenly among all individuals in future generations. Given a large number of investment

[21] This, of course, abstracts from the possibility that in an open economy, the "crowding out" may be more complex. Large government deficits may prevent a decline in the exchange rate (due to interest-sensitive capital inflows) and thus postpone export-led economic recovery.

projects financed by borrowing, there is little likelihood that, in the aggregate, the benefits will be distributed any less evenly than the costs.[22]

U.S. economist Carl Shoup has argued that migration in and out of local, state, or provincial jurisdictions requires that loan finance be used to purchase assets, since "pay-as-you-go" financing would distribute costs and benefits in a random manner. This is not the case at the federal level and, thus, capital financing through borrowing is not as necessary.[23] Such an argument would be more acceptable on these grounds were there no migration in or out of the country.

Advantages of a Capital Budget

In addition to achieving equity between present and future generations, there are other reasons for the development of a capital budget. First of all, such a budget can be viewed as part of a planning program. By placing together in one budget those expenditures designed to enhance productivity over the long term, the development goals of the government could be placed in sharper focus. This focus could provide needed information on the goals of specific programs, and it would clearly indicate shifts in the composition of the total budget between current expenditures and transfers and long-term capital spending. A capital budget need not confine itself entirely to physical assets. As noted earlier, if the capital budget is broadly defined, expenditures for future, nonphysical benefits, such as those expected to accrue from retraining and education, can be included. The budget would also include government investment in private-sector assets through capital subsidies. There would be no need to include depreciation charges in this instance unless the government took an equity position with respect to its investment expenditure.

Second, comprehensive administrative practice suggests that there should be a capital budget that relates annual budgetary allocations to public-sector activities not directly included in the budget. This becomes increasingly important as the number of crown corporations and quasi-government agencies expands. Shifting the post office out of the departmental to the crown corporation category reduces budgetary

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[22]In the case of tax incentives designed to stimulate private investment, Richard Bird has concluded that "it is far from clear that the benefits achieved outweigh the cost incurred" (R.M. Bird, *Tax Incentives for Investment: The State of the Art*, Canadian Tax Paper no. 64 [Toronto: Canadian Tax Foundation, 1980], p. ix.).

[23]C.S. Shoup, "Budgetary Accounting for Fiscal Policy," *Review of Economics and Statistics* 45 (May 1963): 137-140.

expenditure and, thus, the relative size of what is narrowly defined as "government". Since the post office normally functions with a substantial deficit, the budgetary deficit is reduced. This is accounted for in the cash budget since the latter includes loans and advances to crown corporations. While the day-to-day operations of such an agency may result in a deficit that requires financing by government, any advances earmarked for capital formation should be set out separately in the capital budget. Capital budgeting at the local level of government is fairly widespread in Canada, the United States, and elsewhere, and is accepted as "good practice", providing the appropriate framework for consistent and coordinated planning of public works and for decision-making among competing investments. Should the federal and provincial budgets be treated any differently?

Finally, it should be noted that the capital budget would allow the government and the public to monitor in a consistent way the effects of inflation on the cost of servicing public-sector debt.[24] High rates of inflation have contributed to the federal government's nominal deficit because of the high nominal interest payments required when money is borrowed in the market. The interest paid on debt is composed of a real return to the investor plus an inflation premium. The inflation premium is required to ensure that the real value of the debt does not decline, and such a premium should be incorporated into the capital budget. Alternatively, the value of the government's assets could be periodically revalued up to market prices, a practice followed in some parts of the private sector. Since many public- sector assets do not have a market price, inflation adjustment of the debt issued against these assets is more appropriate in the public sector.

Disadvantages of a Capital Budget

There are, of course, difficulties associated with the establishment or development of a capital budget when it comes to putting theory into practice. First, separating capital from current expenditures complicates the analysis of fiscal policy. Whatever its shortcomings, the unified budget does provide for a measure of the expected income-generating effects of the budget in the current or next year. To maintain this traditional and useful type of analysis, expenditures on new public assets would need to be combined with the current expenditure budget, which would include depreciation allowances.

[24] An alternative way to view this is to consider indexed bonds. If such bonds were issued, interest payments would have been lower than they have been in recent years, with reduced deficits (on the current expenditure budget) at all levels of government.

Second, the creation of a capital budget could be used as an apology for public-sector deficits if a sufficient volume of expenditures could be labeled "investments" and moved to the capital budget to ensure that capital spending was equal to the deficit. With the unified budget system practiced by the federal and provincial governments, certain expenditures and programs can be isolated from the annual budget through the creation of crown corporations, loan-guarantee programs, "off-budget" items, and government agencies. The capital budget, it is argued, would further diffuse control over government spending. To avoid such practices, it would be necessary to establish strict control over what constitutes an investment expenditure.

A third problem is that a bias against current expenditure and in favor of capital expenditure might ensue from the establishment of a capital budget. Politicians, wanting to please the public, may opt for expenditures that can easily be deficit-financed, at the expense of current needs that would require tax increases. This issue was one of the main reasons why the President's Commission on Budget Concepts recommended in 1967 against a capital budget for the United States.[25]

In summary, then, there are good conceptual reasons for establishing a capital budget at the federal and provincial levels in Canada: to provide accountability; to incorporate into a budgetary framework all of the grants, subsidies, and tax expenditures that encourage private investment; to allow for appropriate recognition of the impact of the inflation rate on the public debt; and to recognize expenditures on human capital. But these advantages have to be balanced against the risk of budget distortions and the problems of measurement and of arriving at a consensus on components of such a budget. These obstacles may prove difficult to surmount, an issue addressed in the concluding section.

Public Capital Formation: What Should Be Included

It was not until the late 1960s, in the widespread revisions to Canada's National Income Accounts, that government capital expenditure was clearly defined.[26] It included all public spending on buildings and equipment, and changes in inventories and costs associated with the sale or purchase of existing assets.

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[25]United States, President's Commission on Budget Concepts, *Staff Papers and Other Materials* (Washington, D.C.: U.S. Government Printing Office, 1967).

[26]Canada, Dominion Bureau of Statistics, *National Income and Expenditure Accounts, 1926–68*, Cat. no. 13-201 (Ottawa, 1969).

How comprehensive is such a measure? First of all, the series on public gross fixed capital formation excludes military expenditures. Those are placed in the current expenditure category of government expenditures. While much military spending is clearly of this nature, it is inappropriate to include all expenditures as a current outlay. This would treat mashed potatoes for the troops in the same manner as the construction of a new barracks. It is certainly true that in time of war, military equipment and buildings can be depreciated "instantly", but for the most part the purchase of aircraft, ships, and land vehicles and the construction of military bases, particularly in Canada, is carried out to ensure that the benefits of defense to residents of Canada are realized in the future. The construction of a patrol boat in one year can only be viewed as providing a flow of services over four or five years or longer.

With that in mind, it seems reasonable that defense expenditures on fixed assets should be included as public gross fixed capital formation. How this should be depreciated is another matter, since the public capital stock series does not include these military expenditures.

But that is not the only adjustment necessary to arrive at a more appropriate measure of capital spending. Current statistics on government expenditure for gross fixed capital formation still underestimate the public sector's commitment, particularly at the federal level, to investment expenditure. As Richard Bird wrote in 1969:

> It might be suggested that government capital spending is substantially understated because no account is taken of government-supported and -financed private investment...through tax concessions and through direct support.[27]

What Bird referred to as "blue-chip socialism" is far more widespread and important today than it was in the 1960s, and there would be little disagreement with the proposition that governments attempt to exert considerable influence on private capital formation decisions. Some would argue that policies to influence private decisions, such as tax expenditures and accelerated depreciation, have not *created* new private investment expenditures but merely *directed* the flow in the way government desires away from what the private sector would have done in the absence of public-sector interventions.[28]

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[27]R.M. Bird, *The Growth of Government Spending in Canada*, Canadian Tax Papers no. 51 (Toronto: Canadian Tax Foundation, 1970), pp. 145–146

[28]We are abstracting here from the notion that in a period of unemployment and slow economic growth, the government may wish to encourage private spending, broadly defined, by way of a general tax reduction.

Is it possible to measure this phenomenon? The federal government's 1979 *Tax Expenditure Account* identifies the cost in terms of foregone revenue because of the tax preferences associated with private gross fixed capital formation.[29] These data may well underestimate the value of the investments undertaken in the private sector that give rise to the tax loss, because the specific arrangement for a tax deduction rarely equates the value of investment expenditure with the tax loss.

Suppose a potential investment of $1,000 normally depreciates for tax purposes over five years at $200 per year. An accelerated depreciation allowance is introduced that permits the investment to be written off over two years at $500 per year. If t_c is the appropriate corporate profits tax and if the investment would have occurred regardless of the accelerated depreciation, the loss in tax revenue associated with the depreciation is ($500 − 200)$t_c$ for the first two years.[30] As far as can be determined, the data record the tax loss associated with the preferential treatment for total investment expenditures covered by the specific preferential treatment. If all the investment expenditures had taken place even without the tax expenditure provision, the tax loss represents no stimulus to private investment but merely an intertemporal transfer to the owners of capital. Alternatively, if none of the investment had occurred in the absence of the tax expenditure provision, the tax loss underestimates significantly the value of the stimulus to private investment. The truth likely lies somewhere between these two extremes. While it seems obvious that these fiscal policies do contribute indirectly to private capital formation, we have no method of accurately determining the extent of this activity. In fact, it could be argued that almost every change in tax policy influences the scope and direction of private capital formation. It would be impossible, therefore, to include these fiscally induced capital expenditures in a capital budget at this time without having to assume a large margin of error.

Transfer payments to businesses also create a problem in this context. In 1982, the federal government spent $6.5 billion on business subsidies and $760 million on capital assistance, both of which were treated as current expenditures. The latter clearly represents the government's participation in certain capital outlays in the private sector, and such

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[29]Canada, Department of Finance, *Government of Canada Tax Expenditure Account*.

[30]In the third, fourth, and fifth year, the corporation receives no depreciation allowance and, thus, government taxes are higher than they would have been provided the investment had taken place in the absence of the accelerated depreciation. The simple example here is further complicated by the fact that the tax "saving" due to the accelerated depreciation may be used for additional investment by the corporation.

assistance should be treated as publicly assisted private gross fixed capital formation. Subsidies are more difficult to classify. They are paid largely to farm and nonfarm unincorporated businesses, as well as to corporations. They constitute cash payments associated with regulations in the agricultural sector, supplements paid to employers who hire unskilled or semiskilled labor under apprenticeship programs, and payments to oil importers to maintain domestic oil prices below world prices.

Without a detailed study of each subsidy, it is impossible to state the extent to which such subsidies stimulate private gross fixed capital formation. A guess of 20 percent would be as acceptable as one of 50 percent. Whatever the proportion, a subsidy that stimulates capital formation which would not otherwise have taken place and that is not financed by a tax which reduces capital formation represents the government as an investor.

Intergovernmental transfers from the federal government to provincial governments present a problem for a federal capital budget, as do provincial grants to local governments. Those transfers that are part of shared-cost programs frequently involve public gross fixed capital formation. A university building or hospital funded by a province is included as provincial public gross fixed capital formation, even if one-half of the cost is provided by the federal government. Ottawa's contribution is included in total revenues and separated from other revenues, but the use of the funds is "buried" in the expenditure side of the budget. In short, provincial public gross fixed capital formation is overstated and federal public investment is understated. In a similar but less direct way, federal unconditional grants and equalization payments find their way into capital expenditures.[31] Some proportion of these transfers, therefore, should be viewed as federal public investment expenditures.

The final and conceptually most difficult issue in this context is the question of investment in human, as opposed to fixed, asset capital, by far the most important aspect of which is education. The contribution that education has made to increased productivity over the long term is significant and, as Edward Denison has pointed out, it appears to have accelerated in the United States in recent years despite negative growth in productivity.[32]

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[31]It follows that federal transfers to the provinces may be directed by the province toward stimulating private investment and contribute in this manner to the economy's total capital stock.

[32]E.F. Denison, "The Puzzling Drop in Productivity," *Challenge* 22 (May-June 1979): 60–62.

Capital stock estimates by Statistics Canada include expenditures made for the construction and maintenance of schools and universities. Few would argue that these are not outlays that will provide a flow of services over the long term. The construction of a net investment series for such expenditures is relatively straightforward. But how should *current* expenditures on education — such as the wages paid to teachers, professors, and staff — be treated? Is the service a teacher provides a final consumption good, or is the knowledge imparted an investment in human capital that leads to a higher level of productivity than would otherwise be the case for those who are the recipients of education? And what of the myriad manpower training programs sponsored by governments? Clearly, such programs are designed to enhance the income and productivity of workers. In fact, programs of this kind are often subject to the same type of benefit-cost analysis that is applied to investments in physical assets.

Education, by raising national income through increased productivity, leads to an expanded tax base in the same way that a railway network, by opening up new areas, does. In his classic article on public-sector capital budgets, R.A. Musgrave argued that there was a strong case for the inclusion of public physical assets if they lead to an expansion in the tax base: "[T]he assets with which the debt liability ought to be confronted lie in the taxable capacity of the economy."[33] If the government allocates revenues to educate and train members of the labor force whose skills and trades have become redundant because of technological change or industrial strategies, the rate of return of such a program is a combination of the expected higher tax revenues in the future and reduced welfare and unemployment transfers. The major difficulty with the inclusion of such education and training expenditures in a capital budget is in deciding precisely what expenditures should be included. There is no denying that there would be a temptation for governments to shift all manpower programs and education projects to a capital budget, thereby justifying increased borrowing.

Few would argue that all current expenditures on education should be viewed as a tax-base-expanding investment; there is obviously an important personal consumption component to such expenditures. Similarly, not many would assert that education has no human capital component. Should, then, a portion of expenditures on education and training be considered an investment and included in the capital budget? Surely the answer is yes, but the appropriate portion to be

[33]Musgrave, p. 262.

included evades a quantifiable answer. If it is to be excluded, one should note that such an exclusion leads to an underestimation of capital expenditures.

In summary, it is clear that what both the government and statisticians label "public capital expenditures" is an understatement of government expenditures that either enhance economic productivity and growth or bestow benefits to society over a long period of time. Even if we interpreted annual public investment strictly as the net change in the stock of public assets plus depreciation of those assets, the exclusion of certain military goods does not make sense.

Somehow, intergovernmental transfers that are used to construct physical assets must be credited to the capital spending of the donor government. Capital assistance and subsidies to capital formation are surely part of the government's investment package. Finally, as difficult as they may be to measure, there are certain education and training expenditures that meet all the criteria for investment and should be reflected, in some manner, in capital spending.

Measuring Public Capital Expenditure in Canada

The Federal Government

In addition to providing public gross fixed investment series for the federal and provincial governments, Statistics Canada also monitors changes in the outstanding capital stock for the public and part of the "quasi-public" sectors.[34]

The total capital stock of the federal government is broken down into two basic categories: construction, and machinery and equipment. The construction category includes buildings and all forms of engineering construction, such as roads, dams, transmission lines, and resource equipment. The machinery and equipment category includes all office furnishings and equipment. Excluded are outlays for machines and equipment by the Department of National Defence, an omission noted earlier. No reason is given for this decision and, as discussed earlier, the validity of doing so in the context of a capital budget is questionable.

The stock series includes both gross and net values. The gross value represents the full value of the asset as long as it remains in the capital stock, and deductions occur only when the asset is presumed to cease to exist. The net capital stock series is derived by applying a depreciation formula to the gross stock estimate using the "straight line" method and

[34]See, for example, Statistics Canada, *Fixed Capital Flows and Stocks, 1981*, Cat. no. 13-211 (Ottawa, September 1981).

TABLE 2

Federal Capital Expenditures: Nonmilitary and Military, 1972–82

(current $ millions)

	Nonmilitary			Military			Total	
	Gross (1)	Depreciation (2)	Net (3)	Gross (4)	Depreciation (5)	Net (6)	Gross (7)	Net (8)
1972	580	399	181	210	134	76	790	257
1973	691	440	251	167	148	19	858	270
1974	886	520	366	228	175	53	1,114	419
1975	972	607	365	248	203	45	1,220	410
1976	988	685	303	328	227	101	1,316	404
1977	1,010	774	236	446	256	190	1,456	426
1978	1,050	859	191	528	284	244	1,578	435
1979	799	969	−170	658	312	346	1,457	176
1980	922	1,072	−150	810	343	467	1,732	317
1981	1,139	1,207	−68	931	391	540	2,070	472
1982	1,283	1,372	−89	1,050	475	575	2,333	486

Sources: Columns 1, 2, and 3 from Statistics Canada, *Fixed Capital Flows and Stocks, 1982*, Cat. no. 13-211 (Ottawa, August 1982); column 4 from Receiver General for Canada, *Public Accounts of Canada*, various issues; column 5 from author's estimates.

a perpetual inventory procedure. Columns 1 and 2 in Table 2 show gross investment expenditures and associated depreciation for the 1972–82 period.

It would appear that there may be difficulty in determining the appropriate depreciation rate for certain defense assets in terms of the "service-life" concept. In the event of all-out hostilities, certain capital items may be "depreciated" instantly. Even the commitment of equipment for peacekeeping activities may render the service life rather limited. The probability of a very short and unpredictable service life would be rather low, it seems, and suggests that a significant proportion of defense expenditures on buildings and equipment should be included in gross and net fixed capital formation for the federal public sector. Annual outlays for military expenditures on buildings and equipment are shown in column 4 of Table 2. Since there are no depreciation figures for military expenditures, the depreciation formula for nonmilitary capital spending was applied to gross military expenditures on buildings and equipment. Net investment expenditures for total direct outlays on physical assets are shown in column 8 of Table 2.

These estimates of net fixed capital formation refer only to the creation of new assets as part of the government's expenditures on "goods and services". As discussed earlier, there are other categories of federal expenditures, some of which represent expenditures on fixed capital. One of these categories is transfer payments to the provinces.

TABLE 3

Federal "Indirect" Gross Fixed Capital Expenditures: Estimated, 1972–82

($ millions)

	Transfers to provinces (1)	Subsidies[a] (2)	Capital assistance (3)	Total (4)
1972	387	77	181	645
1973	404	93	227	724
1974	487	127	193	807
1975	621	226	288	1,135
1976	477	190	367	1,034
1977	558	183	497	1,238
1978	663	184	556	1,403
1979	717	265	555	1,537
1980	770	227	718	1,715
1981	843	250	761	1,854
1982	944	342	2,288	3,574

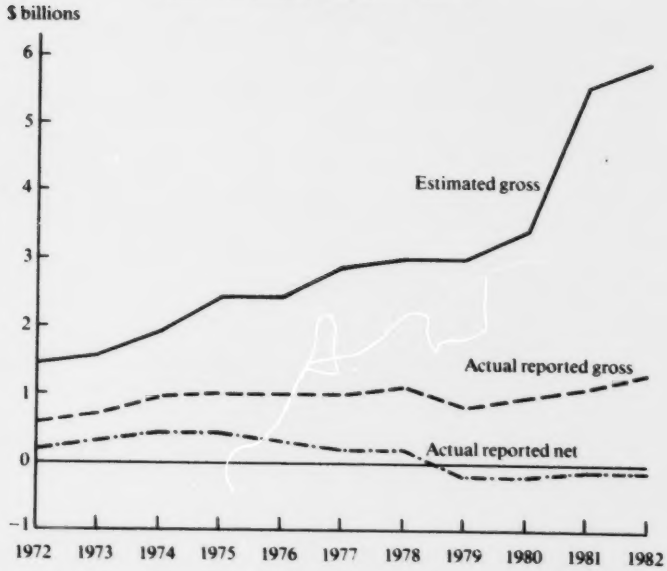
[a]Net of Petroleum Compensation Subsidies that have been paid to oil importers since 1974–75 to equalize the Canadian and world price of oil.

Sources: Canada, Department of Finance, *Economic Review 1981* (Ottawa: Supply and Services Canada, 1981); idem, *Economic Review 1983* (Ottawa: Supply and Services Canada, 1983).

These transfer payments — which constituted 22 percent of federal expenditures in 1982 — are mainly in the form of equalization payments, which go into the general revenues of receiving provinces, and transfers tied to Established Program Financing and specific purpose grants. Without a province-by-province and item-by-item scrutiny of each transfer, it is not possible to calculate the proportion of these transfers that is used for gross fixed capital formation. As a conservative estimate, however, let us assume that the proportion is equal to the ratio of total provincial gross fixed capital formation to total provincial expenditure. Total equalization transfers and other intergovernmental transfers multiplied by this ratio are shown in column 1 of Table 3. It was noted earlier that while subsidies to the private sector may involve an indirect capital expenditure, there is no precise way of determining what proportion of these subsidies finds its way into gross fixed capital formation. In some instances it may be 100 percent, while in other instances the figure may be close to zero![35] Again, as a conser-

[35]There are basically three classes of subsidies: those associated with agricultural production and marketing; business subsidies, such as grants to the Canadian Broadcasting Corporation, to railways, and to specific sectors; and trading losses pertaining to agencies such as the Canadian Wheat Board. See Statistics Canada, *National Income and Expenditure Accounts, Volume 3: A Guide to the National Income and Expenditure Accounts*, Cat. no. 13-549 (Ottawa, September 1975).

FIGURE 1
Federal Capital Expenditures, 1972–82



Sources: Actual reported net from nonmilitary net expenditures, shown in Table 2, column 3; actual reported gross from nonmilitary gross expenditures, shown in Table 2, column 1; estimated gross is the sum of total gross expenditures, shown in Table 2, column 7, and total "indirect" expenditures, shown in Table 3, column 4.

vative estimate, let us assume that the proportion is equal to the ratio of private fixed capital formation to national income. Total subsidies paid multiplied by this ratio are shown in column 2 of Table 3. Transfers under the category of capital assistance involve such programs as cash grants to assist in the building of fishing vessels, home construction grants, and capital assistance under the former Department of Regional Economic Expansion. The total amount of these various capital assistance transfers is shown in column 3 of Table 3.

Ideally, the next step in the analysis would be to apply the appropriate depreciation schedule to each of these "indirect" capital expenditure series. This would provide a net "indirect" capital expenditure series and, when combined with the data from Table 2, would establish a gross and net investment series that would give a more accurate picture of the

change in the public sector's capital stock over time. Such depreciation schedules are not available, however, and for the moment gross investment figures for the broad definition of public-sector capital spending will have to suffice. These are shown in Figure 1 and Table 4.

TABLE 4
Federal Capital Expenditures, 1972–82
(current $ millions)

	Reported investment		Estimated gross investment expenditures[a]
	Gross (1)	Net (2)	(3)
1972	580	180	1,135
1973	691	205	1,582
1974	886	325	2,011
1975	972	320	2,355
1976	988	290	2,350
1977	1,010	240	2,776
1978	1,050	195	2,981
1979	799	−170	2,994
1980	922	−180	3,440
1981	1,139	−185	3,829
1982	1,283	−66	6,117

[a]This column is the sum of column 7 in Table 2 and column 4 in Table 3.

The "reported" net investment data reveal a decline in the net investment series, indicating a reduction in the federal government's stock of capital. Whether that pattern would occur under the broader definition with appropriate depreciation estimates is difficult to say, for the reason noted above. The more rapid growth in the broadly defined, as compared with the reported, gross investment series suggests that the net figure for the former may be increasing slightly. This does not necessarily mean that there are net additions to the federal government's tangible assets, since these could be accounted for by the federal government's role in directly supporting private capital formation.

The Ontario Government

Not all the shortcomings associated with current statistical reporting of capital expenditures at the federal level are evident at the provincial level, but there is clearly an understatement in official publications of provincial capital expenditures. To examine thoroughly the phenomena at the provincial level would require a province-by-province budget analysis. As the constraints on this study preclude such an approach,

the budget of a single province, Ontario, has been chosen as an example for this sector. From the analysis of Ontario's budget, an attempt is made to quantify capital expenditures for all provinces.

Since the late 1970s, the Ontario government has found itself in an uneasy fiscal position, arguing that a balanced budget is a sensible objective, while putting forth a case for loan-financed public investment:

> Sound public finance suggests that government should finance its operating expenditures from current taxation and its capital expenditures from debt issues. Because capital investments are generally long-lived assets, they benefit future generations as well as current taxpayers; long-term debt financing of capital expenditures ensures that the future work force shares in the costs as well as the benefits.[36]

The Ontario government had earlier made a commitment to balance the budget and to ensure that public-sector savings — municipal and provincial as well as teachers' retirement funds — would be channeled into the private sector. By 1982 the budget was some distance from being balanced and the role of loan-financed capital spending was once more enunciated:

> It is suggested that debt financing is a legitimate and, in some cases, even preferable means of paying for capital investments that provide economic and social benefits over a period of years.[37]

The acquisition of new and the replacement of old physical assets by the Ontario government covers three distinct areas of investment: physical assets related to education and health; economic investments such as transportation; and direct private-sector investment through such agencies as the Board of Industrial Leadership and Development. The assistance to the private sector for capital expenditures is considered part of the province's capital spending. It does not take explicit account of the role that provincial "tax expenditures" may play in stimulating investment. The composition of such expenditures for the past ten years is shown in Table 5. The net investment figure is derived

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[36]"Ontario's Borrowing and Public Capital Creation," Budget Paper A, in Ontario, Ministry of Treasury, Economics and Intergovernmental Affairs, *Ontario Budget 1978* (Toronto, 1978), p. A3.

[37]"Public Investment and Responsible Financial Management," Budget Paper C, in Ontario, Ministry of Treasury and Economics, *Ontario Budget 1982* (Toronto, 1982), p. C3.

TABLE 5
Ontario Capital Expenditures, 1972–81
($ millions)

	Type of investment (Gross)				Total investment	
	Social (1)	Indirect economic (2)	Direct private-sector (3)	Miscellaneous (4)	Gross (5)	Net (6)
1972	436	454	43	2	935	654
1973	328	562	28	2	920	607
1974	300	679	45	5	1,029	638
1975	375	834	52	11	1,272	788
1976	304	779	30	13	1,126	619
1977	352	904	42	15	1,313	709
1978	329	862	40	15	1,246	672
1979	279	949	167	21	1,416	722
1980	295	956	157	39	1,447	665
1981	393	993	185	50	1,621	697

Source: "Public Investment and Responsible Financial Management," Budget Paper C, in Ontario, Ministry of Treasury and Economics, *Ontario Budget 1982* (Toronto, 1982), p. C7.

by multiplying gross investment by the recorded ratio of depreciation to gross investment spending for all provinces.

Human-capital-related capital expenditures are primarily those associated with buildings and equipment in the health and education areas, with some one-quarter of these expenditures devoted to recreational and cultural activities.[38] Transportation expenditures — $722 million in 1981 — constitute by far the largest component of indirect economic expenditures, the remainder being accounted for by environmental and waste-management spending. Direct private-sector investment refers to loans and grants made to business to undertake government-approved capital expenditures.

While some attempt has been made to separate current from capital expenditures in Ontario, a much more rigorous framework is required to fully analyze the role of capital spending in the Ontario public sector.

The Total Public Sector

Both the local government and hospital sectors also allocate funds to gross fixed capital formation. Neither sector makes expenditures for capital assistance to the private sector, nor do their budgets contain

[38]The reported Ontario figures are an overstatement if we attribute some portion of federal grants to Ontario as federal capital spending.

significant subsidy programs. Their combined capital expenditures are, however, quite large.

In order to obtain a rough approximation of gross investment spending by the total public sector, gross capital public expenditures as reported in the National Accounts have been augmented by federal military capital spending and federal capital assistance to the private sector; by provincial expenditures directed to private capital spending; and by a portion of provincial subsidies to the business sector.[39] The results are tabulated and totals estimated in Table 6 and Figure 2. These results show that, defined broadly, total gross public sector capital expenditure in 1982 was close to $15 billion, compared with the Statistics Canada figure of just over $10.3 billion. For reasons discussed earlier, it is not possible at this stage to provide a reasonable estimate for broadly defined net public investment.

TABLE 6
Public-Sector Investment Expenditures, 1972–82
($ millions)

	Reported total[a]		Estimated total[b]
	Gross	Net	Gross
1972	4,079	2,385	4,540
1973	4,307	2,342	4,915
1974	5,349	2,937	6,284
1975	6,144	3,323	7,296
1976	6,079	2,957	7,460
1977	6,517	3,013	8,271
1978	6,774	2,851	8,709
1979	7,096	2,634	9,352
1980	7,713	2,675	10,560
1981	9,308	2,599	13,172
1982	10,311	2,869	14,964

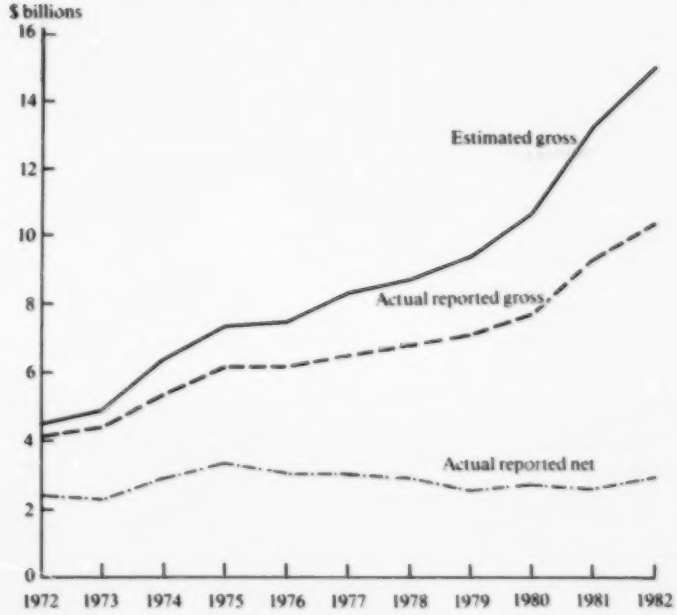
[a]As reported by Statistics Canada, *Fixed Capital Flows and Stocks, 1983*, Cat. no. 13-211 (Ottawa, November 1983).

[b]Adjustments as described in the text for federal government plus adjustments to total provincial data in proportion to adjustments made for Ontario in the text, net of assumed capital transfer by way of intergovernmental grants.

These data are all in nominal terms, and at least a short comment on constant dollar expenditures is called for. The Statistics Canada data on public expenditures on fixed assets are reported in both nominal and constant 1981 dollar terms. There is no "official" method of adjusting

[39]We have assumed that the portion of total provincial subsidies that goes indirectly into private investment is the same as assumed in the federal sector.

FIGURE 2
Public-Sector Capital Expenditures, 1972–82



Source: Table 6.

the additional nominal expenditures that have been included in our broader estimate of public-sector capital expenditure. Consequently, we have chosen to report the comparisons in nominal terms.

But inflation has obviously affected those series, and Table 7 records the Statistics Canada data on real or constant dollar net capital expenditures by the various components of the public sector. These data provide a rough measure of whether the actual capital stock in selected areas is rising or falling.

Statistics Canada's narrow definition of federal net expenditures on fixed assets indicates that, in real terms, such expenditures became negative in 1979. In addition, the capital stocks associated with education were declining. Whether this would be true for the broader definition of capital spending is difficult to say. We can only speculate that, given the rate of growth in the broad definition of gross capital investment, the declines are likely to be less.

TABLE 7
Public-Sector Net Capital Expenditures, 1972–82
(1971 $ millions)

	Schools	Universities	Hospitals	Level of government			Total
				Local	Provincial	Federal	
1972	323	145	112	609	900	175	2,264
1973	218	58	141	618	821	232	2,088
1974	245	13	170	718	747	300	2,193
1975	234	17	134	790	770	267	2,212
1976	158	16	113	723	596	211	1,817
1977	128	6	85	704	614	150	1,687
1978	56	– 5	107	580	618	114	1,470
1979	11	7	99	604	587	– 78	1,230
1980	– 25	19	225	689	488	– 63	1,333
1981	11	12	227	661	450	– 8	1,353
1982	7	– 13	257	700	457	– 22	1,386

Source: Statistics Canada, *Fixed Capital Flows and Stocks, 1983*, Cat. no. 13-211 (Ottawa, November 1983).

In summary, a broader and more realistic definition of public capital expenditures indicates that the current published data understate the rate of change in the accumulation of fixed assets financed by governments.[40] Whether one uses the actual reported data on such expenditures or our estimate for 1982, the amounts are not small.[41] By virtue of their relative importance alone, such expenditures deserve to be scrutinized in a manner that takes into account the intergenerational nature of benefits and the potential contribution such expenditures may make to long-term growth. The current budget framework is not appropriate.

While we have discussed the issue of investment in human capital, we have made no attempt to measure such expenditures beyond incorporating fixed asset expenditures on education and health institutions in the total. The measurement problem is a thorny one and it will be discussed again in the concluding section.

Summary and Implications

The fundamental question that must be addressed is whether it would be practical or worthwhile for the Minister of Finance and his provincial counterparts to present to their legislatures a capital budget along with the more "traditional" budget. Public expenditures cannot be lumped together in one single category. Fundamental principles of economics have always underscored the important difference between expenditures on goods and services and those on transfer payments — for good reason. The separation of current from capital expenditures, be they direct expenditures on capital or indirect by way of capital transfers, also makes sense. Clearly, there are expenditures whose benefits are immediately exhausted through consumption while others are of such a nature that the benefits flow to society over a long period of time and do, in many instances, contribute to the nation's economic growth and productivity.

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[40]This implies that investment expenditure by the private sector is overstated to the extent that governments provide money directly to the business sector to purchase fixed assets.

[41]It will be recalled that the proportion of intergovernmental transfers that went into capital expenditures and the share of subsidies that were similarly allocated were based, respectively, on the ratio of reported provincial public investment to total provincial spending and the ratio of private fixed investment to GNP. These were considered low estimates. If federal grants to provinces represented three times the capital spending of 6 percent assumed in 1981, federal capital investment would have been $1.7 billion greater. If one-half of the subsidies went into capital expenditures, that would raise total public capital expenditures by an additional $1 billion in 1981.

TABLE 8
Public-Sector Net Capital Stock, 1972–82
(1971 $ billions)

	Schools	Universities	Hospitals	Level of government			Total[a]	Percentage change
				Local	Provincial	Federal		
1972	8.75	3.45	3.93	11.29	14.89	10.32	52.62	—
1973	9.02	3.56	4.06	11.91	15.75	10.52	54.82	4.18
1974	9.30	3.60	4.21	12.58	16.54	10.79	57.02	4.01
1975	9.50	3.61	4.36	13.33	17.30	11.07	59.17	3.77
1976	9.68	3.63	4.49	14.09	17.98	11.31	61.18	3.40
1977	9.83	3.64	4.59	14.80	18.58	11.49	62.93	2.86
1978	9.93	3.64	4.68	15.44	19.20	11.62	64.51	2.51
1979	9.96	3.64	4.79	16.04	19.80	11.64	65.87	2.11
1980	9.96	3.64	4.92	16.64	20.34	11.57	67.01	1.73
1981	9.95	3.64	5.07	17.36	20.81	11.54	68.41	1.72
1982	9.95	3.67	5.41	18.04	21.22	11.52	69.81	2.05

[a]Due to rounding, totals do not necessarily add horizontally.

Source: Statistics Canada, *Fixed Capital Flows and Stocks, 1983*, Cat. no. 13-211 (Ottawa, November 1983).

Other things being equal, the present practice of having only one budget for both current and capital spending implies that an increase in the acquisition of assets, if financed by borrowing, would produce a deficit. Given the public's attitude toward deficits, there may well be reluctance on the part of government to approve needed capital expenditures. Capital spending in the public sector needs to be considered in a more appropriate context. The *idea* of treating public capital expenditures in a manner different from current expenditures goes back more than a century, and the concept of the capital budget has been explored in a series of articles, books, and reports in the United States since the 1930s. Various forms of capital budget analysis have been introduced in several countries, and the notion of a separate "capital" budget is prevalent in local government in many countries.

This study has examined the case for a capital budget in Canada. The advantages of such a budget are immediately apparent: an orderly accounting of the change in the size and composition of the public-sector infrastructure; a proper charging of depreciation costs to the current budget; a clear recognition of just what expenditures contribute to economic growth and productivity; and an ability to discuss, in a more meaningful way, the notion of a balanced budget. These advantages do not, unfortunately, come free. How should human capital "investments" be treated, particularly in terms of depreciation? Should capital expenditures that clearly are, in part, subsidies to labor in a region be included in a capital budget? Would a capital budget merely be an apology for sustaining large deficits and even expanding them?

For many years the practical arguments against the development of a tax expenditure account carried sufficient weight that it was not until 1979 that an official tax expenditure account was published. This was by no means the definitive account, but its existence in the public domain has led to informed public debate and constructive criticism. The development of a capital budget has suffered a similar fate up to now. It is our contention that not to attempt even to develop a simple capital budget approach for the federal sector is inexcusable. The present definition of public investments might lead, for example, to the conclusion that public-sector investment and capital accumulation are rapidly slowing (see Table 8). This definition is, however, too narrow to draw such a conclusion. There are pitfalls of proceeding with a new approach but, in our view, to stumble at this time is preferable to falling off a cliff in the future.

The first step in the design of a capital budget is to ensure that there is a comprehensive list of federal expenditures on public assets and

assistance to private capital formation. In addition, then, to the official data, one would include expenditures on:

- military assets;
- the public fixed asset component of intergovernmental grants;
- subsidies directed to private fixed capital formation;
- capital assistance transfers; and
- current budget allocations to cover crown corporation capital expenditures.

The public fixed asset component of intergovernmental grants could be estimated more accurately than we have done by reviewing the composition of those projects under the *Established Program Financing Act* to determine their capital intensity and then allocating that capital "share" to the transfer. Capital formation subsidies could be approximated by undertaking a detailed study of each major subsidy and the accountability of the use of the funds. It should then be possible to obtain an estimate of the proportion of a given subsidy that goes to a capital expenditure. The Public Accounts are sufficiently detailed that capital expenditures of crown corporations can be estimated directly.

For long-range planning purposes and to monitor the stock of public assets and other investments, it might be advisable to organize these capital expenditures by functional categories such as telecommunications, transportation, military, health, education and research, and cultural recreation. Such series do not provide us with a comprehensive view of public-sector investments, however, because they exclude crown corporation investments. It was noted earlier that while federal government departments may invest directly in crown corporations or provide them with an advance, expenditures on fixed assets by crown agencies are not in the budget. This fact recently led the Auditor General to comment:

> In my view, the current definition of the Government of Canada accounting entity based on legal form is not satisfactory. The accounting entity should be defined in such a way that the *economic substance of an activity* [emphasis added] determines how that activity should be reported.[42]

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[42] "Observations by the Auditor General on the Financial Statements of the Government of Canada," in Receiver General for Canada, *Public Accounts of Canada, 1982, Volume I: Summary Report and Financial Statements* (Ottawa: Supply and Services Canada, 1982), Section 3, p. 5.

Moving an activity out of a department and into an agency responsible to that department means that monies allocated to the agency for capital expenditures are not classified as government investment. Obviously, such investments are more closely linked to public capital formation than are grants to the private sector. Data on crown corporation activities are sufficiently detailed that we would recommend investment expenditure by such agencies, financed by the public treasury, be part of the capital budget.

To develop a set of accounts that would reflect net as well as gross public-sector investment requires the application of depreciation rates to existing capital stock. Since these are available for both the public and private sectors, it would seem reasonable to apply private-sector depreciation rates to those expenditures by the federal government that enhance private capital stocks.

While the detailed capital expenditure accounts suggested above would clearly improve our understanding of the public sector's role in capital formation, it is our belief that it would be useful to establish a highly aggregate capital account and relate it to a current budget account (see Table 1). In a period when the government deemed it prudent to expand the real stock of public assets, borrowing could take place to enhance revenues in the capital budget. In future periods, this would increase debt-servicing costs and would require additional revenue from the current budget. In addition, depreciation expenses would rise unless the government decided intentionally to liquidate some of its assets.

The implication for balanced budgets is clear: the current budget should balance over the business cycle. Obviously, a recession will cause a shortfall in taxes and higher transfer payments, creating a deficit in the current budget that would be financed by short-term borrowing from the central bank or from the private sector. This would require that there be surpluses in periods of economic expansion to facilitate debt retirement.

The reader will have noticed the absence in this section of any discussion related to expenditure on human capital. In earlier sections, an argument was made, on theoretical grounds, that certain expenditures on education and training were equivalent to investment in fixed assets in terms of enhancing long-term economic growth. In practice, there are significant problems both in measuring these investments and in establishing corresponding depreciation schedules. These practical problems should not lead to the myopic conclusion that such expenditures cannot be included in a capital budget approach to public

finances. Far more research needs to be done, however, before these expenditures are incorporated into a capital budget.

Revisions to the present budget approach would require a commitment of time and money if a significant and reasonable set of concepts and definitions is to be established. The definition of a public investment is critical to the success of such a venture, and it must be clear and well-defined to ensure that the capital budget does not become an excuse for increasing deficits.

Such a concept would permit a more rational approach to public finance and the government's role in financial markets. It would clearly define a legitimate area of public loan finance and create a more trustful relationship between government and the private sector. A capital budget would much more clearly define the contribution that public expenditures can make to economic growth. There are risks but these are short term in nature. The longer-term gains from budget reform are likely to be worth such risks. Unless reform is undertaken, debates about the appropriate mix of public expenditures will continue to be based on an inadequate accounting framework. The result could be underinvestment in the maintenance and expansion of public infrastructure that contributes to improved productivity and growth in the private sector.

Policy Analysis Committee

The C.D. Howe Institute Policy Analysis Committee (HIPAC) was formed in 1980 from the Canadian Economic Policy Committee, established in 1961. This change was brought about to help streamline the Institute's activities and to improve the process of accountability of staff to the Institute's members.

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